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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,673	09/17/2003	Hiroya Kirimura	TGW-0202	2468

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EXAMINER	
ARANCIBIA, MAUREEN GRAMAGLIA	
ART UNIT	PAPER NUMBER
1763	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/663,673	KIRIMURA ET AL.	
	Examiner	Art Unit	
	Maureen G. Arancibia	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4 and 16-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4 and 16-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11 October 2006 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 4, and 16-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,099,687 to Yamazaki in view of U.S. Patent 5,006,192 to Deguchi and U.S. Patent 6,302,964 to Umotoy et al.

In regards to Claims 1 and 20, Yamazaki teaches a plasma processing apparatus (Figures 2 and 3), comprising a vacuum chamber 110 with an exhausting device 130; a supporting member 141 for supporting an article 180 to be processed; a gas supplying device 120 opposed to the surface of article 180, with a gas supply portion 124 and gas supply holes 123 (Column 4, Lines 5-13); and a power applying device 150 including four divided electrodes 151a-151d and high frequency power

sources 152a-152d individually connected to each of the divided electrodes. The gas supply member is not connected to the power sources 152a-152d (Figure 3). The exhausting device 130 discharges gas from the periphery of the supporting member 141, which is a region in the vicinity of the periphery portion of the gas supply member (i.e. the periphery of the chamber 110), *as broadly recited in the claim.* (Column 4, Lines 14-31) The divided electrodes 151a-151d are disposed in a quadrilateral shape in a plan view surrounding the space between the article to be processed and the gas supply surface portion of the gas supply member, each divided electrode being disposed adjacent an inner surface of the vacuum container 110 such that the gas supply member, the article 180 to be processed, and the supporting member 141 are disposed internally of the quadrilateral shape. (Figure 3)

In regards to Claims 1 and 20, Yamazaki does not expressly teach that the supporting member is grounded.

Deguchi teaches that a supporting member 1a can be grounded. (Column 4, Lines 20-21; Column 6, Lines 17-19)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by Yamazaki to have the supporting member be grounded, as taught by Deguchi. The motivation for doing so, as taught by Deguchi (Column 4, Lines 19-32), would have been to aid in the formation of a high voltage electric field in the vacuum chamber.

Further in regards to Claim 1, Yamazaki does not expressly teach that each of the divided electrodes is in the shape of a bent plate forming two electrode sections integrally connected substantially perpendicularly to each other.

Deguchi teaches electrodes 10 are each in the shape of a bent plate forming two electrode sections integrally connected substantially perpendicularly to each other (*electrodes 10 having a L-shaped cross sectional form*; Column 5, Lines 30-34; Figures 3a and 3b), as broadly recited in the claim.

It would have been obvious to one of ordinary skill in the art to modify the divided electrodes taught by Yamazaki to each have the shape of a bent plate forming two electrode sections integrally connected substantially perpendicularly to each other, as taught by Deguchi. The motivation for making such a modification, as taught by Deguchi (Column 4, Lines 15-67; Column 5, Line 30 - Column 6, Line 2), would have been to aid in the formation of plasma between the divided electrodes and the inner walls of the vacuum chamber (*in a space 9 outside of the substrate treating discharge space 5*; Column 5, Lines 30-34), in order to perform discharge cleaning of the vacuum chamber between process runs.

In regards to Claims 1 and 20, the combination of Yamazaki and Deguchi does not expressly teach that the gas supply member has a hollow plate member having the gas supply surface portion and a cover air-tightly covering the hollow plate member opposite the gas supply surface portion, or that the hollow plate member defines a hollow internal space formed therein with a first plurality of gas supply holes formed in the gas supply surface portion in fluid communication with the hollow internal space of

the hollow plate member, the cover forming an air-tight gas-receiving compartment with a second plurality of gas supply holes extending through the hollow plate member, formed in the gas supply surface portion and in fluid communication with the gas-receiving compartment but in fluid isolation from the hollow internal space of the hollow plate member such that the film-forming gas is supplied to the hollow internal space of the hollow plate member via a first gas guide duct and the film-forming gas is supplied to the gas-receiving compartment via a second gas guide duct being independent of the first gas guide duct, both the film-forming gas supplied to the hollow internal space of the hollow plate member via the first gas guide duct and the film-forming gas supplied to the gas-receiving compartment via the second gas guide duct are dispersed into the space between the article to be film-covered and the gas supply surface portion of the gas supply member opposed to the article as the film-forming gases exit respective ones of the first and second plurality of gas supply holes formed in the gas supply surface portion independently of each other. Further in regards to Claims 4, 17-19, and 21-23, the combination of Yamazaki and Deguchi does not expressly teach that the distribution density and area of opening of the gas supply holes vary with radial distance from the center of the gas supply surface, or specifically in such a way that the amount of gas blowing from the gas supply surface portion is increased from a peripheral region to a central region, or vice versa.

Umotoy et al. teaches a gas supply member comprising a hollow plate member 1502 having a gas supply surface portion and a cover 132 air-tightly covering the hollow plate member opposite the gas supply surface portion (Figure 15; Column 4, Lines 14-

22), wherein the hollow plate member defines a hollow internal space 1509 formed therein with a first plurality of gas supply holes 1520 formed in the gas supply surface portion in fluid communication with the hollow internal space of the hollow plate member (Figure 15), the cover forming an air-tight gas-receiving compartment (above upper surface 1506) with a second plurality of gas supply holes 1510 extending through the hollow plate member, formed in the gas supply surface portion and in fluid communication with the gas-receiving compartment but in fluid isolation from the hollow internal space of the hollow plate member (Column 8, Lines 55-58), such that the film-forming gas is supplied to the hollow internal space 1509 of the hollow plate member via a first gas guide duct 136 and the film-forming gas is supplied to the gas-receiving compartment via a second gas guide duct 134 being independent of the first gas guide duct, both the film-forming gas supplied to the hollow internal space of the hollow plate member via the first gas guide duct and the film-forming gas supplied to the gas-receiving compartment via the second gas guide duct are dispersed into the space 104 between the article 106 to be film-covered and the gas supply surface portion of the gas supply member opposed to the article as the film-forming gases exit respective ones of the first and second plurality of gas supply holes formed in the gas supply surface portion independently of each other. (Column 3, Line 55 - Column 4, Line 13; Column 8, Line 6 - Column 9, Line 49; Figure 15) Umotoy et al. further teaches that the distribution density of the gas supply holes and the area of opening of the holes can vary with radial distance from the center of the gas supply surface, such that gas flow rates through the holes are correlated wit the location of the hole in the gas supply

surface. (Column 4, Line 54 - Column 5, Line 5; note that as the holes have a fixed center-to-center spacing, changing the hole size would necessarily also change the distribution density of the holes)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by the combination of Yamazaki and Deguchi to use the gas supply member as taught by Umotoy et al. The motivation for doing so, as taught by Umotoy et al. (Column 1, Line 21 - Column 2, Line 67), would have been to allow two precursor gases to be supplied to the processing space in such a way that the first time they come in contact with each other is in the processing space, thereby reacting to form a reaction product that, for example, is deposited on the surface of the substrate to be processed. This would prevent the reaction product of the two gases from being deposited on the interior of the gas supplying mechanism. (Column 1, Line 65 - Column 2, Line 3) It further would have been obvious to one of ordinary skill in the art to vary the distribution density and area of opening of the gas supply holes with radial distance from the center of the gas supply surface, and through routine experimentation, to specifically vary these result-effective variables in such a way that the amount of gas blowing from the gas supply surface portion is increased from a peripheral region to a central region, or vice versa, in order, as taught by Umotoy et al. (Column 4, Line 54 - Column 5, Line 5), to optimize the gas flow based on the types of gases being supplied and other process conditions, such as gas flow rate, chamber pressure, and gas pressure.

Further in regards to Claims 17-19 and 21-23, Yamazaki et al. teaches that the exhausting device is capable of maintaining the gas pressure in the processing space at

6.67 to 40 Pa (50 to 300 mTorr; Column 5, Lines 26-30), which overlaps with the claimed range recited in Claims 17-19 and 21-23, and thus meets the recited limitation.

It has been held that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). In the instant case, the combination of Yamazaki, Deguchi, and Umotoy et al. teaches all of the structural limitations of the claims, and would be structurally capable of performing the intended use of forming a thin film on an article to be processed, simply by varying the process settings and type of process gas. Specifically in regards to Claims 17-19 and 21-23, the apparatus taught by the combination of Yamazaki, Deguchi, and Umotoy et al. would be structurally capable of supplying any of the claimed combinations of processing gases through the gas supply mechanism, and due to the properties of the exhausting device taught by Yamazaki et al., would be structurally capable of maintaining the pressure within the claimed range. (See also MPEP 2114.)

In regard to Claim 16, the combination of Yamazaki, Deguchi, and Umotoy et al. just discussed does not expressly teach that the apparatus further comprises a driving device disposed at least partially in the vacuum container and connected to the supporting member, the driving device being operative to move the supporting member either towards or away from the gas supply surface portion of the gas supply member.

Umotoy et al. further teaches a driving device (the pedestal stem labeled with arrow 110 indicating vertical movement; Figure 15) disposed at least partially in the vacuum chamber and connected to a supporting member 108, the driving device being operative to move the supporting member either towards or away from the gas supply surface portion of the gas supply member. (Column 3, Line 60 - Column 4, Line 2)

It would have been obvious to one of ordinary skill in the art to further modify the apparatus taught by the combination of Yamazaki, Deguchi, and Umotoy et al. to include a driving device as taught by Umotoy et al. The motivation for doing so, as taught by Umotoy et al. (Column 3, Line 60 - Column 4, Line 2), would have been to allow the supporting member to be moved between a loading/unloading position and a process position for the substrate to be processed.

Response to Arguments

4. Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Application Publication 2002/0152960 to Tanaka et al. also teaches the claimed gas supply member. (Paragraphs 36-42 and 59-66; Figures 2 and 5)

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571)

272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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